CLAIMS

1. A fluid pump comprising:

a pump having an inlet and an outlet through which a fluid can pass;

a pump drive mechanism arranged to drive said pump at a selected speed;

a pressure transducer capable of measuring a pressure value of said fluid passing through at least one of said inlet and said outlet of said pump and produce an electrical signal correlated to said pressure value; and

a microprocessor having a control logic program and being capable of receiving as input said electrical signal correlated to said pressure value;

wherein, said microprocessor produces an output electrical signal used by said pump drive mechanism to drive said pump at said selected speed based on said control logic program.

2. The fluid pump of claim 1 further comprising another pressure transducer capable of measuring a pressure value of said fluid passing through at least one of said inlet and said outlet of said pump and produce an electrical signal correlated to said pressure value; one of said pressure transducer and said another pressure transducer measuring pressure of said fluid passing through said inlet and the other measuring pressure of said fluid passing through said outlet.

3. The pump of claim 1, further comprising:

a mode selector switch that engages various electrical circuits depending upon the position of the switch to select a mode of operation of said pump.

4. The pump of claim 3, wherein said mode of operation is selected from the group containing: start mode, manual mode, and automatic mode

5. The pump of claim 4, further comprising:

a potentiometer that provides manually adjustable inlet and outlet pressure control in said manual mode.

6. The pump of claim 1, wherein said microprocessor uses at least one of a first known mathematical relationship between the speed of said pump drive mechanism and the inlet pressure at said pump, and a second known mathematical relationship between the speed of said pump drive mechanism and the outlet pressure at the pump to compute a pump drive mechanism speed that would theoretically maintain at least one of said inlet and outlet pressures at about the value at which said inlet and outlet pressures were measured via said electrical signal correlated to said actual pressure value.
7. A pump of claim 6, wherein said microprocessor computes the specific weight of the fluid being pumped from measured values of inlet and outlet pressures during pumping, and uses the computed specific weight to select the first and second known mathematical relationships.
8. A pump of claim 1, wherein said output electrical signal is a voltage that is calculated by said microprocessor according to calibration data relating a pressure controller output signal to a pump drive mechanism speed.
9. A pump of claim 1 wherein said microprocessor compares said electrical signal to at least one pressure limit and computes at least one of a target inlet drive mechanism speed and target outlet drive mechanism speed that depend on whether the measured pressure reading is greater than or less than said pressure limit.
10. A pump of claim 9, wherein said microprocessor uses a mathematical relationship between the speed of said pump drive mechanism and a voltage level of said output electrical signal to select an output electrical signal that corresponds to said target pump drive mechanism speed.

11. The pump of claim 9, wherein:

said output electrical signal is determined in a manner to correlate with a pump drive mechanism speed that is the lesser of a target outlet speed and a target inlet speed;

the target inlet speed is a maximum drive mechanism speed if the measured inlet pressure is greater than or equal to a maximum inlet pressure range value;

the target inlet speed is the greater of a minimum drive mechanism speed and a speed calculated to maintain the measured inlet pressure, if the measured inlet pressure is less than a maximum inlet pressure range value;

the target outlet speed is a maximum drive mechanism speed if the measured outlet pressure is less than or equal to a minimum outlet pressure range value; and

the target outlet speed is the lesser of a minimum drive mechanism speed and a speed calculated to maintain the measured outlet pressure, if the measured outlet pressure is greater than a minimum outlet pressure range value.

12. A method of controlling fluid pressure in at least one of a pump inlet and pump outlet, said method comprising:

providing a digital pressure controller comprising:

a microprocessor for manipulating an input electrical signal according to specific control logic; and

wherein the inputs to the digital pressure controller at least include electrical signals correlated to measured pressure values at the inlet and outlet of the pump, and wherein the output of the digital pressure controller is used to control the speed of the pump drive mechanism;

reading a measured value of at least one of an inlet and outlet pressure at said pump;

comparing at least one of said measured values of inlet and outlet pressure to at least one of a minimum and maximum pressure limit;

computing at least one of a target inlet drive mechanism speed and a target outlet drive mechanism speed based on whether at least one of the measured inlet and outlet pressure readings are greater than or less than said at least one of a minimum and maximum pressure limit;

setting an output electrical signal from said digital pressure controller to a value that corresponds with at least one of the target drive mechanism speeds computed in the step of computing; and

controlling fluid pressure by adjusting pump drive mechanism speed according to the output voltage signal of the pressure controller.

13. The method of claim 12, further comprising the steps of

selecting the lesser of a target inlet drive mechanism speed and a target outlet drive mechanism speed; and

setting an output electrical signal from said digital pressure controller to a value that corresponds with the target drive mechanism speed selected in the step of selecting.

14. A digital pressure controller for use with a pump having an inlet and an outlet through which a fluid can pass and which can be driven at a selected speed by a pump drive mechanism, said digital pressure controller comprising:

a microprocessor having a control logic program and being capable of receiving as input an electrical signal correlated to said pressure value, said electrical signal being generated by a pressure transducer capable of measuring a pressure value of said fluid passing through at least one of said inlet and said outlet of said pump to correlate to said pressure value;

wherein, said microprocessor produces an output electrical signal used by said pump drive mechanism to drive said pump at said selected speed based on said control logic program.

15. The digital pressure controller of claim 14, wherein said microprocessor uses at least one of a first known mathematical relationship between the speed of said pump drive mechanism and the inlet pressure at said pump, and a second known mathematical relationship between the speed of said pump drive mechanism and the outlet pressure at the pump to compute a pump drive mechanism speed that would theoretically maintain at least one of said inlet and outlet pressures at about the value at which said inlet and outlet pressures were measured via said electrical signal correlated to said actual pressure value.

16. A digital pressure controller of claim 15, wherein said microprocessor computes the specific weight of the fluid being pumped from measured values of inlet and outlet pressures during pumping, and uses the computed specific weight to select the first and second known mathematical relationships.